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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,074

04/14/2006

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EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/576,074	Applicant(s) LEE ET AL.	
	Examiner Audrey Y. Chang	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/14/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remark

- This Office Action is in response to applicant's preliminary amendment filed on April 14, 2006, which has been entered into the file.
- By this amendment, the applicant has canceled claims 1-11 and has newly added claims 12-22.
- Claims 12-22 remain pending in this application.

Claim Objections

1. Claims 1-22 are objected to because of the following informalities:

(1). The phrase "the fill factors ... are defined as a function of the dispersion of said material with the wavelength in the first portion and the second portion so as to obtain an element blazed over a wide spectral band" recited in claim 12 is confusing and indefinite. The fill factor as defined in the specification is referred to be "dimension d of the microstructure divided by the sampling period of the grating: $f = d/\lambda$ ", (please See paragraph [0020]). It is not clear how could this factor being a function of dispersion of the said material with the wavelength? Please clarify.

(2). The phrase "where n_{\max} and n_{\min} are respectively the values" recited in claim 13 has been repeated twice. Please clarify such typographic error.

(3). Claim 19 recites the phrase "as claimed in the preceding claim" that is confusing since it is not clear if this claim is a multiple dependent claim or what? Also it is not clear which claim or claims does this claim depend from?

(4). The phrase "the optical system" recited in claims 21 and 22 is confusing since it lacks proper antecedent basis from their respective based claim.

Appropriate correction is required.

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2. **Claim 13 is objected to under 37 CFR 1.75(c)**, as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The parameter α defined in claim 13 is inherited in the optical element recites in claim 12, (its based claim).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Morrison (PN. 5,11,286) in view of the patent issued to Wiki (PN. 6,922,287).**

Morrison teaches a diffractive optical element of binary type, (please see Figures 8-11), with binary microstructures with variable fill factors, i.e. the ratio of the width of the microstructure and the period "p" of the grating, etched on a surface of an optical material. It is implicitly true that the effective index material is affected by the microstructures and it varies between a maximum and a minimum value. It is also implicitly true that when the microstructures are viewed as pillar geometry, the effective refractive index increases as the increases of the fill factor, since the width of the microstructure is referred to the width of the pillar. When the microstructures are viewed as holes geometry, then the effective refractive index decreases as the increases of the fill factor, since the width of the microstructures is referred to the holes. Morrison teaches that the diffractive optical element of the binary type has the profiles as shown in Figures 8-11, which can be viewed to either have pillar forms or to have holes form or a mixture of two. In particular, as explicitly taught by **Wiki** that a diffraction grating has microstructures of pillar geometry, (Figure 6) is really analogous to diffraction grating having hole

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geometry, (Figure 7, column 5, lines 44-50). It would then have been obvious to one skilled in the art to apply the teachings of Wiki to interpret section of the binary grating profile of Morrison to have hole geometry and section of the binary grating profile to have pillar geometry so that the effective refractive index has inverse behavior with respect to the increase of the fill factor.

With regard to the feature “the fill factors ... are defined as a function of the dispersion of said material with the wavelength in the first portion and the second portion so as to obtain an element blazed over a wide spectral band” recited in claim 12, it is not clear what does this phrase mean since the specification only give the definition that the fill factor is the ratio of the width of the microstructures and the period. This phrase therefore cannot be examined here.

With regard to claim 13, it is implicitly true that the optical material would have dispersion property, namely the refractive index is a non-constant function of the wavelength. The α parameter is implicitly defined for the binary diffractive element. The maximum and minimum effective index can be calculated with respect to the variation of the fill factors.

With regard to claim 16, since the definition of “high refractive index” is relative, the optical material for the binary diffractive element can be regarded as to have high refractive index.

With regard to claims 17 and 18, these references however do not teach explicitly that the zones are referred to Fresnel zones or echelette grating, however it is known in the art that binary grating can be formed within Fresnel zones or echelette grating, such modification would have been obvious to one skilled in the art.

With regard to claim 19, the dependency of the claim is really unclear, such that the scopes of the claim is unclear and cannot be examined.

With regard to claims 20-22, these reference do not teach explicitly that the optical system is for imaging, however it has been held it has been held that a recitation with respect to the manner in which a

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claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872

/Audrey Y. Chang/
Primary Examiner, Art Unit 2872